AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A data processing system for determining respective coefficients of at least part of at least a first polynomial, the system comprising:

a plurality of ~~comprising a first~~ arithmetic units, each arithmetic unit comprising at least one finite field multiplier and at least one finite field adder for selectively performing at least two finite field arithmetic calculations;

~~the data processing system comprising~~ means to use a previous finite field arithmetic calculation result of ~~the~~ a first arithmetic unit of the plurality of arithmetic units in a current finite field arithmetic calculation of the first arithmetic unit; and

at least one finite field adder for combining respective finite field arithmetic calculation results of respective current finite field arithmetic calculations of at least two of the arithmetic units ~~to determine respective coefficients of at least part of at least a first polynomial~~.

2. (Original) A data processing system as claimed in claim 1 in which a first arithmetic operation of the at least two arithmetic operations comprises a first finite field multiplication operation.

3. (Currently Amended) A data processing system as claimed in claim 2 in which the first finite field multiplication operation comprises calculating at least a first multiplication of $\delta\sigma^{(i-1)}(x)$ in a first clock cycle, where $\sigma^{(i-1)}(x)$ is an error locator polynomial at step (i-1) and δ is a previous step discrepancy.

4. (Currently Amended) A data processing system as claimed in claim 2 in which the finite field arithmetic operation comprises calculating at least a second multiplication operation of $\Delta^{(i)}x\lambda^{(i-1)}(x)$ in a second clock cycle, where $\Delta^{(i)}$ is a step discrepancy at step i and $\lambda^{(i-1)}(x)$ is an auxiliary polynomial at step (i-1).

5. (Original) A data processing system as claimed in claim 1 in which a second arithmetic operation of the at least two arithmetic operations comprises a finite field addition operation.

6. (Currently Amended) A data processing system as claimed in claim 5 in which the finite arithmetic addition operation comprises calculating at least part of $\delta\sigma^{(i-1)}(x)+\Delta^{(i)}x\lambda^{(i-1)}(x)$ as the current finite field arithmetic operation using $\delta\sigma^{(i-1)}(x)$ as at least part of the previous finite field arithmetic operation~~.~~, where $\sigma^{(i-1)}(x)$ is an error locator polynomial at step (i-1), δ is a previous step discrepancy, $\Delta^{(i)}$ is a step discrepancy at step i and $\lambda^{(i-1)}(x)$ is an auxiliary polynomial at step (i-1).

7. (Currently Amended) A data processing system as claimed in claim 1 further comprising ~~at least one further such~~ the plurality of arithmetic units operable substantially in parallel ~~with the first arithmetic unit~~ to calculate respective coefficients of at least part of at least a first polynomial.

8. (Currently Amended) A data processing system as claimed in claim 7 in which the first polynomial comprises at least $\delta\sigma^{(i-1)}(x)+\Delta^{(i)}x\lambda^{(i-1)}(x)$, where $\sigma^{(i-1)}(x)$ is an error locator polynomial at step (i-1), δ is a previous step discrepancy, $\Delta^{(i)}$ is a step discrepancy at step i and $\lambda^{(i-1)}(x)$ is an auxiliary polynomial at step (i-1).

9. (Original) A data processing system as claimed in claim 1 in which the at least two arithmetic calculations comprises a second finite field multiplication operation in a third clock cycle.

10. (Original) A data processing system as claimed in claim 9 in which the second finite field multiplication operation comprises calculating at least one coefficient of a second polynomial.

11. (Currently Amended) A data processing system as claimed in claim 9 in which the second arithmetic operation comprises calculating at least $S_{i-j+1}\sigma_j^{(i)}$, wherein S_{i-j+1} is coefficient i-j+1 of a syndrome polynomial and $\sigma_j^{(i)}$ is a coefficient j of an error locator polynomial at step i.

12. (Currently Amended) A data processing system as claimed in claim 11 in which the second arithmetic operation comprises calculating at least part of $\Delta^{(i+1)}= S_{i+1}\sigma_0^{(i)}+S_i\sigma_1^{(i)}+\ldots+S_i$-

$_{t+1}\sigma_t^{(i)}$, where $\Delta^{(i+1)}$ is a step discrepancy at step (i+1) and S_i is coefficient i of a syndrome polynomial.

13. (Currently Amended) A data processing system as claimed in claim 1 comprising at least (t+1) such arithmetic units operable substantially in parallel, each unit producing respective coefficients of at least one of a first polynomial, $\sigma^{(i)}(x)=\delta\sigma^{(i-1)}(x)+\Delta^{(i)}x\lambda^{(i-1)}(x)$, and a step discrepancy, ~~and a second polynomial,~~ $\Delta^{(i+1)}=S_{i+1}\sigma_0^{(i)}+S_i\sigma_1^{(i)}+\ldots+S_{i-t+1}\sigma_t^{(i)}$, where $\sigma^{(i-1)}(x)$ is an error locator polynomial at step (i-1), δ is a previous step discrepancy, $\Delta^{(i-1)}(x)$ is a step discrepancy at step i, $\lambda^{(i-1)}(x)$ is an auxiliary polynomial at step (i-1) and S_i is coefficient of a syndrome polynomial.

14. (Original) A data processing system as claimed in claim 1 in which the first arithmetic unit is arranged to calculate at least a respective part of at least part of a further polynomial.

15. (Original) A data processing system as claimed in claim 14 in which the further polynomial is an error evaluator polynomial.

16. (Currently Amended) A data processing system as claimed in claim 14 in which calculating the further polynomial comprises calculating

$$\begin{aligned}\Omega(x) &= S(x)\sigma(x) \bmod x^{2t}\\ &= (S_0+S_1x+\ldots+S_{2t-1}x^{2t-1})\cdot(\sigma_0+\sigma_1x+\ldots+\sigma_tx^t) \bmod x^{2t}\\ &= \Omega_0+\Omega_1x+\ldots+\Omega_{t-1}x^{t-1}, \text{ where}\end{aligned}$$

$\Omega_i = S_i\sigma_0+S_{i-1}\sigma_1+\ldots+S_{i-t+1}\sigma_{t-1}$, where i = 0,1,…,t-1, and where $\Omega(x)$ is an error evaluator polynomial, s(x) is a syndrome polynomial and $\sigma(x)$ is an error locator polynomial.

17. (Currently Amended) A data processing system as claimed in claim 14 in which the at least a respective part of at least part of the further polynomial comprises calculating:

$\Omega_i = \Omega_i^{(t-1)}$, where

$\Omega_i^{(j)} = S_i\sigma_0$, for j = 0; and

$\Omega_i^{(j)} = \Omega^{(j-1)}+S_{i-j}\sigma_j$, for $1\leq j \leq$ t-1~~i~~,

where Ω_i is coefficient I of an error evaluator polynomial $\Omega(x)$, S_i is coefficient I of a syndrome polynomial S(x) and σ_i is coefficient I of an error locator polynomial σ (x).

18 - 20. (Cancelled)

21. (New) A data processing system as claimed in claim 14 wherein $\Omega(x)$ is calculated in t clock cycles.

22. (New) A data processing system as claimed in claim 3, wherein the error locator polynomial $\sigma(x)$ is calculated in 6t clock cycles.

23. (New) A data processing system as claimed in claim 8, wherein the error locator polynomial $\sigma(x)$ is calculated in 6t clock cycles.